

REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Regarding the objection to the specification, the specification is amended to include references to related applications at the beginning, as suggested in the outstanding Office Action. Accordingly, it is respectfully requested that objection be withdrawn.

Claims 3, 4, 7, 10, 13, 16, and 18-21 are pending in the present application. Claims 3, 4, 10, 13, and 16 are amended and Claims 18-21 are added by the present amendment. Claims 5, 8, 11, 14, and 17 stand withdrawn in response to a previous restriction requirement.

Amendments to Claims 3, 4, 10, 13, and 16 find support in the originally filed specification at least in Figure 3B, and new Claims 18-21 find support in the originally filed specification at least at page 14, line 20, to page 15, line 13 and in Figure 3B. It is believed no new matter is added.

In addition, substitute Figures 1A, 3B, 3C, and 4A are included to correct reproduction errors found at the periphery of each Figure. It is believed no new matter is added.

In the outstanding Office Action, the specification was objected to and Claims 3, 4, 7, 10, 13, and 16 were rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,100,912 to Shiraishi et al. (herein “Shiraishi”).

Claims 3, 4, 7, 10, 13, and 16 were rejected as anticipated by Shiraishi. Applicants respectfully traverse that rejection.

Amended Claim 3 is directed to an optical scanning device condensing a beam deflected by a light deflector, by a scanning and imaging lens toward a surface to be scanned to form a beam spot thereon, and scanning the surface to be scanned by the beam spot. At least one lens of the scanning and imaging lens is configured so that a lens body thereof is

held by a holding frame. An inner rib surface at an end in a longitudinal direction of the holding frame is inclined so that a ghost light generated as a result of the deflected beam being reflected by the holding frame is turned outside of an effective writing range in a main scan direction. Further, an outer rib surface at the end in the longitudinal direction of the holding frame is parallel to an optical axis through a center of the scanning and imaging lens. Amended independent Claims 10, 13, and 16 include similar features.

As noted in the specification, rigidity of plastic-made lenses are increased when they are supported by a rib with an outer surface that is parallel to a central optical axis D, as shown in Figures 3B and 3C as non-limiting examples.<sup>1</sup> Further, to reduce the adverse effect of ghost light generated due to reflection by the inner rib surface 9a", the inner rib surface 9a" is inclined by an angle  $\alpha$  to deflect ghost light away from a scanned surface 7, as clarified in new dependent Claims 18-21. This arrangement advantageously reduces lens deformation by keeping the outer rib surface parallel to the central optical axis D and reduces ghost light by inclining the inner rib surface away from the central optical axis D.

Applicants respectfully submit that Shiraishi does not teach or suggest an outer rib surface parallel to an optical axis of the scanning and imaging lens. Shiraishi illustrates outer rib surfaces for lenses 30a and 30b that appear to be inclined away from the central optical axis, in FIGs. 2, 33, and 36-39. In other words, the outer rib surfaces of Shiraishi are not parallel to the central optical axis, as in the claims. Accordingly, it is respectfully submitted that Shiraishi does not teach or suggest “an outer rib surface at the end in the longitudinal direction of the holding frame is parallel to an optical axis through a center of the scanning and imaging lens,” as in the independent claims.

Accordingly, it is respectfully submitted that independent Claims 3, 10, 13, and 16, and claims depending therefrom, are allowable.

---

<sup>1</sup> Specification at page 4, lines 11-23.

Moreover, applicants note the dependent claims even further distinguish over the applied art. New dependent Claim 18 is directed to an image forming apparatus having an inclination angle  $\alpha$  of the inner rib that satisfies the equations  $\{ H - L \times \tan(\theta - 2\alpha) \} > W/2$ , and  $\alpha < \theta$ , where  $H$  is a height of the inner rib surface from the optical axis,  $L$  is a distance between the inner rib surface and the surface to be scanned,  $W$  is the effective writing range and  $\theta$  is a half field angle on the inner rib surface. New dependent Claims 19-21 include similar features.

As discussed above, Figures 3B and 3C show an example embodiment having an inner rib surface 9a" inclined by an angle  $\alpha$  to deflect ghost light away from a scanned surface 7, and thereby reduce lens deformation while reducing ghost light. Further, the specification at page 14, line 20, to page 15, line 6 illustrates an example embodiment having an inner rib inclination angle  $\alpha$  that satisfies the equation  $\{ H - L \times \tan(\theta - 2\alpha) \} > W/2$ . In addition, the specification at page 14, lines 7-13, and Figures 3B and 3C illustrate an embodiment having an inner rib inclination angle  $\alpha$  that satisfies the equation  $\alpha < \theta$ .

Applicants respectfully submit that Shiraishi does not teach or suggest an inclination angle that satisfies these equations. Shiraishi does not teach or suggest any details regarding the inclination angle of an inner rib surface in Figures 2, 33, and 36-39. Thus, applicants respectfully submit that Shiraishi does not disclose an inner rib inclination angle that satisfies the claimed equations.

Further, Shiraishi illustrates an inner rib angle in Figs. 2, 33, and 36-39 that appears to be equivalent to or greater than the half field angle. For example, in Fig. 2, Shiraishi shows an inner rib of lens 30a having an inclination angle that appears parallel to the path of a light beam (e.g., half field angle), and also shows an inner rib of lens 30b having an inclination angle that appears greater than an angle of the path of a light beam. In other words, Shiraishi

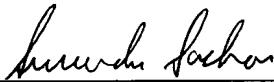
discloses an inner rib inclination angle that appears to be equivalent to or greater than a half field angle (i.e.,  $\alpha \geq \theta$ ), which is different than the claimed arrangement have  $\alpha < \theta$ .

In such ways, dependent claims 18-21 even further distinguish over the applied art.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



---

Gregory J. Maier  
Attorney of Record  
Registration No. 25,599

Surinder Sachar  
Registration No. 34,423

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 08/03)

GJM:SS:ZSS:dnf

I:\ATTY\ZS\23\S\238\238228US\238228 AMENDMENT 042604.DOC